

**UNCLASSIFIED**

**AD 430621**

**DEFENSE DOCUMENTATION CENTER**

**FOR**

**SCIENTIFIC AND TECHNICAL INFORMATION**

**CAMERON STATION, ALEXANDRIA, VIRGINIA**



**UNCLASSIFIED**

NOTICE: When government or other drawings, specifications or other data are used for any purpose other than in connection with a definitely related government procurement operation, the U. S. Government thereby incurs no responsibility, nor any obligation whatsoever; and the fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use or sell any patented invention that may in any way be related thereto.

64-9

51

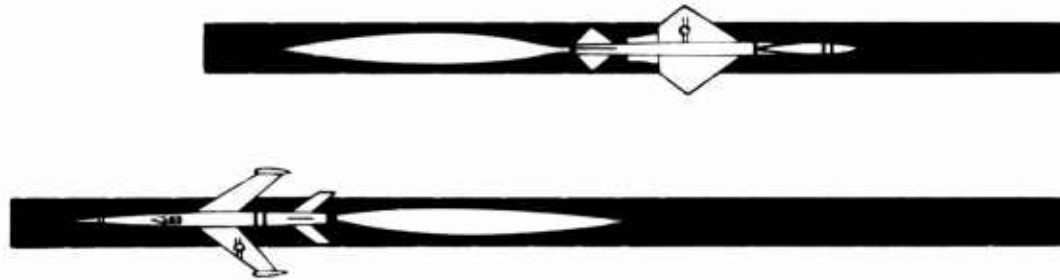
430621

**EUR-MED COMMUNICATION SYSTEM**  
**GENERAL PERFORMANCE SPECIFICATION**

**ICS-62-SPEC-170**

CATALOGED BY DDC  
AS AD No.

430621



**ITT COMMUNICATION SYSTEMS, INC.**  
**PARAMUS, N.J.**

When US Government drawings, specifications or other data are used for any purpose other than a definitely related government procurement operation, the government thereby incurs no responsibility nor any obligation whatsoever; and the fact that the government may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or conveying any rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.

Qualified requesters may obtain copies from Defense Documentation Center (DDC). Orders will be expedited if placed through the librarian or other person designated to request documents from DDC.

Copies available at Office of Technical Services, Department of Commerce.

31 August 1962

EUR-MED COMMUNICATION SYSTEM  
GENERAL PERFORMANCE SPECIFICATION

ITT COMMUNICATION SYSTEMS, INC.  
PARAMUS, NEW JERSEY  
CONTRACT AF19(626)-4  
ICS-62-SPEC-170

Prepared for  
480L SYSTEM PROGRAM OFFICE  
UNITED STATES AIR FORCE  
L.G. HANSCOM FIELD  
BEDFORD, MASSACHUSETTS

## TABLE OF CONTENTS

	<u>Section</u>	<u>Page</u>
1.	SCOPE	1
2.	APPLICABLE DOCUMENTS	2
	2.1 PRECEDENCE OF SPECIFICATIONS	2
3.	REQUIREMENTS	3
	3.1 MAJOR SUBSYSTEMS	3
	3.2 TRANSMISSION SUBSYSTEM	3
	3.3 BASE TERMINAL AREA SUBSYSTEM	3
	3.4 TRANSMISSION REQUIREMENTS	3
4.	RELIABILITY REQUIREMENTS	6
	4.1 GENERAL	6
5.	ACCEPTANCE TESTS	7
	5.1 SUBSYSTEMS AND EQUIPMENT	7
	5.2 SYSTEM ACCEPTANCE	7
	5.3 SYSTEM TEST PLAN	7
6.	NOTES	8
	6.1 EXCEPTIONS	8

GENERAL PERFORMANCE SPECIFICATION  
EUROPEAN-MEDITERRANEAN COMMUNICATIONS SYSTEM

1. SCOPE

This specification covers the requirements for a communications system operating in the Mediterranean Basin. The system provides medium capacity trunk communications linking specified military bases in this area. This specification embraces the system design and performance requirements for the transmission system designated as the European-Mediterranean Tropospheric Scatter Communications System and for the terminal circuits and engineering to be provided at the prescribed military bases.

## 2. APPLICABLE DOCUMENTS

The following documents and all specifications subsidiary thereto of the issue in effect on the date of invitation for bids form a part of this specification to the extent specified herein.

### SPECIFICATIONS

ICS-61-SPEC-100	Performance Specification, European-Mediterranean Tropospheric Scatter Communications System, 8 September 1961, amended 1 February 1962.
ICS-62-SPEC-130	General Specification, Base Area and System Terminals, 31 August 1962.

### TECHNICAL REPORTS

ICS-62-TR-54	EUR-MED Tropo. System Test Concept
--------------	------------------------------------

### 2.1 PRECEDENCE OF SPECIFICATIONS

In the event of conflict between the requirements of this specification and the requirements of any specification referenced herein, the requirements of this specification shall govern.



### 3. REQUIREMENTS

#### 3.1 MAJOR SUBSYSTEMS

The European-Mediterranean Communications System shall consist of the following subsystems

- a. Transmission Subsystem
- b. Base Terminal Area Subsystem

#### 3.2 TRANSMISSION SUBSYSTEM

The Transmission Subsystem shall consist of the European-Mediterranean Tropospheric Scatter Communications System whose performance requirements are set forth in Specification ICS-61-SPEC-100.

#### 3.3 BASE TERMINAL AREA SUBSYSTEM

The Base Terminal Area Subsystem shall conform to the performance requirements set forth in Specification ICS-62-SPEC-130.

#### 3.4 TRANSMISSION REQUIREMENTS

3.4.1 GENERAL.- The transmission design shall be such that the communications channels provided are capable of rendering high grade service to the Zone of the Interior (ZI) when interconnected with long haul transmission circuits external to the system and having suitable transmission characteristics.

3.4.2 CIRCUIT TERMINATIONS.- The transmission design shall provide for termination of telephone circuits in either two-wire or four-wire terminations. Telegraph circuits shall terminate in  $\pm 20$  milliamperes (ma) two-path polar loops.

#### 3.4.3 VOICE CIRCUIT TRANSMISSION REQUIREMENTS

3.4.3.1 Two-Wire Circuits.- Transmission performance of voice circuits between two-wire terminations shall be designed in accordance with the following performance objectives.

a. Net Loss.- Two-wire circuits shall be designed to provide a nominal net loss of 7.5 decibels (db) between two-wire terminals of the hybrids. (This includes 0.5 db for switching centers.) An objective of the system design and maintenance operations shall be that any group of trunks will have a transmission equivalent bias of not more than  $\pm 0.25$  db about the design value with a distribution grade of not more than 1 db measured at the radio building combined distribution frame. Definitions of the terms, "bias" and "distribution grade", are given in Figure 130-5 in ICS-62-SPEC-130.

b. Singing Margin.- Two-wire circuits shall provide a margin against singing of at least 8 db in the speech band.

c. Echo.- Two-wire circuits shall be designed to provide echo performance which will satisfy 99 percent of all users based on current Bell System Echo Tolerance Tables when working into a subscriber loop having at least a 9 db echo return loss as measured at the base PABX combined distribution frame.

d. Total Combined Transmission Equivalent.- The total combined transmission equivalent between two-wire subscriber sets in the European-Mediterranean Communications System shall be designed for a nominal of 12.5 db.

3.4.3.2 Four-Wire Voice Circuits.- Transmission performance of voice circuits between four-wire terminations shall be designed in accordance with the following performance objectives. The four-wire voice circuits shall provide a nominal net loss of 0 db with an allowance of 0.5 db for future installation of tandem and base four-wire switching centers. It shall be an objective of the system design and maintenance operations that any group of trunks will have a transmission equivalent bias of not more than  $\pm 0.25$  db about

the design value and a distribution grade of not more than 1 db measured at the radio building combined distribution frame. The terms, "bias" and "distribution grade", are defined in Figure 130-5 in ICS-62-SPEC-170. The total combined transmission equivalent between four-wire subscriber sets in the European Mediterranean Communications System shall be designed for a minimum of 12.5 db.

#### 3.4.4 TELEGRAPH TRANSMISSION REQUIREMENTS

3.4.4.1 Operating Speed.- Telegraph circuits shall be designed for operation at signaling speeds of up to 75 bauds.

3.4.4.2 Mode of Operation.- Telegraph circuits shall be designed for operation in either the start-stop mode or the synchronous mode using continuous binary stream transmission.

3.4.4.3 Distortion Objective.- It shall be a design objective to provide telegraph transmission such that the peak distortion of any circuit does not exceed 20 percent of the normal unit pulse between switching centers or on-line cryptographic equipments at any operating speed of up to 75 bauds.

#### 4. RELIABILITY REQUIREMENTS

##### 4.1 GENERAL

The design of the European-Mediterranean Communications System shall be such that the system is capable of being operated and maintained so as to provide a channel availability of 99.9 percent averaged over a year of operation. Channel Availability is defined in Specification ICS-61-SPEC-100.

## 5. ACCEPTANCE TESTS

### 5.1 SUBSYSTEMS AND EQUIPMENT

Acceptance tests for the Transmission and Base Terminal Area Subsystems shall be as defined in their individual specification.

### 5.2 SYSTEM ACCEPTANCE

System tests shall include but not be limited to the following:

#### 5.2.1 TWO-WIRE VOICE CIRCUITS

- a. Determination of operating net loss, bias, and distribution grade
- b. Singing margin
- c. Echo path loss

#### 5.2.2 FOUR-WIRE VOICE CIRCUITS

Determination of operating net loss, bias, and distribution grade.

#### 5.2.3 TELEGRAPH CIRCUITS

Distortion and error rate

### 5.3 SYSTEM TEST PLAN

The contractor shall prepare a comprehensive system acceptance test plan (including procedures, schedules and equipment) and submit said plan to the procuring agency for approval. This plan shall include but not be limited to the tests required by ICS-62-TR-54 and the subsystem specifications referenced herein and shall include tests to be conducted in the following areas:

- a. Equipment acceptance tests
- b. Equipment installation tests
- c. Inter-station tests
- d. Sectionalized system tests
- e. Overall system tests
- f. Operation and maintenance tests

Upon approval of the test plan by the procuring agency, this plan shall form the basis for formal acceptance of the system by the Government.

6. NOTES

6.1 EXCEPTIONS

It is the intent of this specification to establish the performance requirements that are considered necessary for the application on hand. In the event exceptions are taken to any of these specifications, they must be called to the attention of the procuring activity at the time of submission of bids or proposals. The reason for the exception shall be given and an alternative recommendation made. After receipt of order, work shall not be initiated until approval or denial of the requested waiver has been received from the procuring activity.

**UNCLASSIFIED**

**UNCLASSIFIED**